

TROPICAL CENTRAL PACIFIC *CYPRAEIDAE*

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The knowledge of the distribution of the *Cypraeidae* is here supplemented and extended by listing the species of this mollusk family occurring on specific tropical central Pacific islands. New records for Pacific islands are listed, and cowry faunas are revealed for islands from which the *Cypraeidae* have not yet been reported.

The following islands are included here in separate sections with a discussion of the reef waters about each, United States Navy Department (1933): Mortlock Islands, Caroline Island Group; Nassau Island, Pukapuka Island, Jarvis Island, Line Island Group; Baker Island, and Howland Island. The species listed here from the above islands are housed in the Bernice P. Bishop Museum, Honolulu, Hawaii. All were collected by reliable collectors.

Schilder and Schilder (1939) in the most recent published summary of the distribution of the *Cypraeidae* generally include cowries from areas and not from specific islands, i.e., "Marquesas Is., Flint I. to Palmyra I. and Johnston I." The writer believes that since so many of the published records of the *Cypraeidae* were based on collections where locality data were inadvertently mixed, that specific island lists, based on known reliable collections, are necessary to clarify the distribution of this well known family. Thus the writer's earlier work is continued in an attempt to clarify the somewhat mixed geographical distribution of the *Cypraeidae*, Ingram (1937) (1937a) (1938) (1939) (1939a) (1940). Examples of past and present mixing of cowry distributional data are found in Hawaii. The examples cited here are only incidental to the many that the writer has found in examining collections in the United States. Specimens brought into the Hawaiian Islands by the missionary ship, Morning Star, from distant islands filtered into local Hawaiian collections, when in reality they were found elsewhere in Polynesia. Published reports on Hawaiian cowries have included Morning Star material, thus giving a distorted report of the

cowries actually found in the Hawaiian Islands (Bryan, 1915), (Schilder and Schilder, 1939). In recent years specimens were brought to the Hawaiian Islands by the Pan-American colonizers from Johnston, Baker, and Howland Islands. The writer saw a number of very fine *Cypraeidae* for sale from the above islands while collecting in Hilo, Hawaii in 1937. No doubt this material will eventually filter into collectors hands as being from Hawaii, and once again the cowry fauna of the Hawaiian Islands will be distorted. One accurate and complete list of the Hawaiian *Cypraeidae* was published in 1937 (Ingram, 1937), based on personal collecting and on the collections of the following scientifically trained men who had collected in the islands for twenty years, Mr. W. G. Anderson, Mr. David Thaanum, Mr. Ted Dranga, Prof. Jens M. Ostergaard, and the late Mr. L. A. Thurston. This list has already been distorted by accepting unreliable data, namely Bryan's 1915 data (Schilder and Schilder, 1939).¹

CYPRAEIDAE FROM THE MORTLOCK ISLANDS, CAROLINE ISLAND GROUP

The Mortlock Islands, Nomoi Islands, consist of three distinct groups of coral islands and reefs known as Lukunor, Satawan, and Etal. The Lukunor Islands are situated on a reef approximately eighteen miles in circuit, and enclose an oval-shaped lagoon lying in a northwest and southwest direction. Satawan Reef consists of sixty small islets surrounding an oval-shaped lagoon, about seventeen miles in length with approximately the same trend as the above island group. The Etal Islands lie to the north of Satawan, and are about seven miles in circuit. They consist of a number of low, thickly wooded islets, connected by a reef in whose center there is a lagoon.

The mollusks from these islands were presented to the Bernice P. Bishop Museum by Mr. J. S. Emerson. There are thirty-two species represented in the collection. Based on the number of

¹Two of the specific names used by Ingram (1937, op. cit.) have correctly been placed in synonymy by Schilder and Schilder (1939, op. cit.) i.e., *Cypraea peasei* Sowerby = *Cypraea gaskoini* Reeve; *Cypraea punctulata* Gmelin was incorrectly used to refer to *Cypraea teres* Gmelin.

individuals of any one species in this collection the following are the most common: *Cypraea carneola* Linnaeus, *C. tigris* L., *C. arabica* L., *C. annulus* L., *C. moneta* L., *C. lynx* L., and *C. poraria* L.

One of the notable specimens in this collection is a large *Cypraea lynx* L. which measures approximately 73 mm. along an anterior-posterior axis. Both the white and pink base color varieties of *Cypraea mappa* L. are in the collection. The cylindrical and oval forms of *Cypraea carneola* L. are represented in the cabinet, the latter form being the so-called variety, *propinqua* Garrett. The list follows:

<i>Cypraea annulata</i> Gray	<i>Cypraea intermedia</i> Gray
<i>Cypraea annulus</i> L.	<i>Cypraea isabella</i> L.
<i>Cypraea arabica</i> L.	<i>Cypraea lynx</i> L.
<i>Cypraea arenosa</i> L.	<i>Cypraea mappa</i> L.
<i>Cypraea argus</i> L.	<i>Cypraea moneta</i> L.
<i>Cypraea asellus</i> L.	<i>Cypraea poraria</i> L.
<i>Cypraea caputserpentis</i> L.	<i>Cypraea scurra</i> Chemnitz
<i>Cypraea carneola</i> L.	<i>Cypraea stolidia</i> L.
<i>Cypraea caurica</i> L.	<i>Cypraea teres</i> Gmelin ³
<i>Cypraea clandestina</i> L.	<i>Cypraea talpa</i> L.
<i>Cypraea cruenta</i> Gmelin	<i>Cypraea tigris</i> L.
<i>Cypraea cumingii</i> Gray ²	<i>Cypraea ventriculus</i> Lam.
<i>Cypraea crosa</i> L.	<i>Cypraea vitellus</i> L.
<i>Cypraea erronea</i> L.	<i>Nuclearia staphylaea</i> (L.)
<i>Cypraea felina</i> Gmelin	<i>Ipsa childreni</i> (Gray)
<i>Cypraea helvola</i> L.	<i>Pustularia cicercula</i> (L.)

CYPRAEIDAE FROM LINE ISLANDS

The cowries from Pukapuka Island were collected by Ernest Beaglehole; those from Nassau Island were taken by F. L. McFall. The collection from Jarvis Island was gathered by the members of the Whippoorwill Expedition from the Bernice P. Bishop Museum.

Pukapuka Island, one of the three Danger Islands, 10° 53' S., 165° 49' W., is a coral atoll with a maximum height of eighty feet above sea level. Fifteen species are in the collection from

² As illustrated in G. B. Sowerby, *Thesaurus Conchyliorum*, pl. 3, figs. 349-350, 1870.

³ As illustrated in G. B. Sowerby, *Thesaurus Conchyliorum*, pl. 27, fig. 261, 1870.

this island; of these *Cypraea arenosa* L., is the most common. Two individuals, *Cypraea vitellus* L. and *Cypraea lynx* L., are extremely large. The specimen of the former species has an anterior-posterior length of 84 mm., the specimen of the latter species measures 65 mm. along the anterior-posterior axis. List follows.

<i>Cypraea annulus</i> L.	<i>Cypraea moneta</i> L.
<i>Cypraea arenosa</i> L.	<i>Cypraea talpa</i> L.
<i>Cypraea fimbriata</i> Gmelin	<i>Cypraea testudinaria</i> L.
<i>Cypraea intermedia</i> Gray	<i>Cypraea tigris</i> L.
<i>Cypraea irrorata</i> Gray	<i>Cypraea ventriculus</i> Lam.
<i>Cypraea isabella</i> L.	<i>Cypraea vitellus</i> L.
<i>Cypraea lynx</i> L.	<i>Nuclearia nucleus</i> (L.)
<i>Cypraea mauritiana</i> L.	

NASSAU ISLAND

Nassau Island, 11° 33' S., 165° 25' W., is approximately forty-five miles southeast by south of the Danger Islands. A fringing reef surrounds the island. *Cypraea ventriculus* Lamarek, *Cypraea mauritiana* L., and *Cypraea poraria* L. are the most common of the species in the collection.

<i>Cypraea arenosa</i> L.	<i>Cypraea isabella</i> L.
<i>Cypraea caputserpentis</i> L.	<i>Cypraea mauritiana</i> L.
<i>Cypraea helvola</i> L.	<i>Cypraea poraria</i> L.
<i>Cypraea intermedia</i> Gray	<i>Cypraea testudinaria</i> L.
<i>Cypraea irrorata</i> Gray	<i>Cypraea ventriculus</i> Lam.

JARVIS ISLAND

Jarvis Island, 0° 23' S., 160° 02' W., is a small coral island of one and eight-tenths miles in length. *Cypraea caputserpentis* L. is the most common of the nine species in the collection.

<i>Cypraea arenosa</i> L.	<i>Cypraea moneta</i> L.
<i>Cypraea caputserpentis</i> L.	<i>Cypraea poraria</i> L.
<i>Cypraea intermedia</i> Gray	<i>Cypraea scurra</i> Chemnitz
<i>Cypraea isabella</i> L.	<i>Cypraea vitellus</i> L.
<i>Cypraea lynx</i> L.	

CYPRAEIDAE FROM BAKER AND HOWLAND ISLANDS

The specimens from these islands were collected by members of the scientific staff of the Bernice P. Bishop Museum's Whippoorwill Expedition in 1924 (Edmondson, 1924).

BAKER ISLAND

Baker Island, 0° 13' N., 176° 33' W., is a coral island of about a mile in length. It is surrounded by a coral reef from two hundred to four hundred feet in breadth.

<i>Cypraea cribraria</i> L.	<i>Cypraea scurra</i> Chemnitz
<i>Cypraea crosa</i> L.	<i>Cypraea talpa</i> L.
<i>Cypraea isabella</i> L.	<i>Cypraea testudinaria</i> L.
<i>Cypraea lynx</i> L.	<i>Cypraea tigris</i> L.
<i>Cypraea moneta</i> L.	<i>Cypraea vitellus</i> L.
<i>Cypraea poraria</i> L.	<i>Nuclearia nucleus</i> (L.)
<i>Cypraea teres</i> Gmelin ⁴	

HOWLAND ISLAND

Howland Island, 0° 49' N., 176° 43' W., possesses a fringing reef and is about two miles long. Seventeen species are in the collection, of these *Cypraea intermedia* Gray, *Cypraea caputserpentis* L., and *Cypraea mauritiana* L. are common.

<i>Cypraea annulus</i> L.	<i>Cypraea poraria</i> L.
<i>Cypraea caputserpentis</i> L.	<i>Cypraea teres</i> Gmel.
<i>Cypraea carneola</i> L.	<i>Cypraea reticulata</i> Martyn
<i>Cypraea helvola</i> L.	<i>Cypraea scurra</i> Chemn.
<i>Cypraea intermedia</i> Gray	<i>Cypraea talpa</i> L.
<i>Cypraea isabella</i> L.	<i>Cypraea testudinaria</i> L.
<i>Cypraea lynx</i> L.	<i>Cypraea vitellus</i> L.
<i>Cypraea mauritiana</i> L.	<i>Nuclearia nucleus</i> (L.)
<i>Cypraea moneta</i> L.	

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⁴ As illustrated in G. B. Sowerby, Thesaurus Conchyliorum, pl. 27, fig. 261, 1870.

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A WEST AMERICAN JULIA

BY H. A. PILSBRY AND A. A. OLSSON

As living mollusks, species of *Julia* are known in the central Pacific (*J. exquisita* Gould, Hawaii) and Indian Ocean (Réunion). Fossil forms have been described from lower to middle Miocene of Florida (*J. floridana* Dall) and the West Indies (*J. gardnerae* Woodring), and Woodring mentions three from slightly older, Helvetian and Aquitanian, French beds.

The Panamic species here described as *J. equatorialis* is the first living American species. It seems to be the smallest of these little clams now known. Its rather long and narrow anterior end is most like *J. borbonica* (Desh.), but that species differs by having a straight ventral margin. *J. exquisita* Gld., as figured by Dall, Bartsch and Rehder, differs by the same feature. According to Gould it attains a length of 5 mm.

JULIA EQUATORIALIS, n. sp. Plate 9, figs. 10, 11.

Shell small, usually between 2 and 3.8 mm. in length. When fresh, the color of the shell is green or greenish yellow but on weathering it soon becomes white. The valves are moderately convex, subquadrate in form, the dorsal margin more strongly convex than the ventral; the anterior end is produced to form a short to fairly long wing, somewhat pointed at the end. Beaks prosogyrate, their position varying somewhat with the length of the anterior wing. Hinge edentulous. Lunule is deeply sunken. In the left valve its inner edge is strongly thickened so that it resembles a large rounded tooth, projecting into the valve cavity. In front of this toothlike process and below the beak it is excavated. In the right valve the lunule does not project so far inward and is not enlarged at the end, but the central part is raised, toothlike, fitting into the excavation mentioned in the lunule of the other valve. Texture of valves is somewhat trans-